THE TRANSIT OF VENUS

THE following telegrams have been received by the *Times* since our last issue.

"*Melbourne, Dec.* 11.—The American Expedition in Tasmania experienced unfavourable weather for their observations of the Transit of Venus."

"*Sydney, Dec.* 10.—The Transit observations here proved satisfactory."

"*Berlin, Dec* 17.—A telegram has been received from the German Astronomical Expedition at Tschifu, in North-eastern China, announcing that the observation of the Transit of Venus was quite successful. The observation of the contact, the heliometer measurement, and the photographs succeeded splendidly. The expedition was admirably supported by His Imperial Majesty's ship *Arcona*."

From Major Palmer, Christchurch, New Zealand :—

"English, nothing valuable anywhere—clouds. Americans got ingress, and photographs till near third contact. Nobody egress."

From Mr. Todd, Adelaide :—

"Transit of Venus.—Ingress cloudy. Egress well observed. Contacts 34434, 3475. (Probably 3h. 4m. 43·4s., and 34m. 7·5s. Adelaide mean time, for internal and external contacts.) No black drop."

From Vienna :—

"According to a telegram received by the Imperial Academy of Sciences from Drs. Weiss and Oppolzer, who went to observe the Transit of Venus at Jassy, the observation of external contact at the moment of the exit has succeeded. As they had time to fix the exact longitude and latitude of their point of observation, they obtained reliable data for calculation. The longitude was determined by telegraphic time signals with the Observatory in Vienna. As Jassy lies on the limits of the line where the phenomenon was visible, they attribute some importance to their observations."

Through Reuter's agency :—

"*Pekin, Dec.* 9.—The French astronomical party, under the direction of M. Fleuriais, succeeded in observing the first and second contacts. There was a slight black ligament. Photographs were taken. The weather was slightly hazy."

It will be seen that the news from New Zealand is of a most serious character, so far as the English scheme of observation is concerned. In fact, unless the French, Germans, and Americans have secured observations, the Delislean attack, so far as egress is concerned, has failed altogether. We shall postpone any further remarks till next week, as in the interval some information may be received from the stations to which we have referred.

NOTES

WE are informed that the Council of the Royal Society has appointed a Committee to consider the means of securing observations of the total eclipse of the sun in April next, to which they attach great importance.

PROF. CLERK-MAXWELL, F.R.S., has promised to give a lecture at the Chemical Society on Feb. 18 next, "On the Dynamical Evidence of the Molecular Constitution of Bodies."

THE *Times* states that Prof. Huxley is to undertake the duties of the Chair of Natural History in the University of Edinburgh during the ensuing summer session, in the absence of Prof. Wyville Thomson, who is with the *Challenger* Surveying Expedition.

THE Arctic Expedition Committee sits twice a week, and is making steady progress in organising preparations. The engines of the *Cygnet* gunboat, a new vessel, are to be removed and placed in the *Alert*, now in dock. Although not yet officially announced, we believe that the Admiralty have selected Commander Albert Markham as one of the commanding officers of the Arctic Expedition. Lieut. Aldrich, of the *Challenger*, is coming home with Capt. Nares to take part in the expedition. The decision recently made public that none but those of the Royal Navy would be permitted to take part in the expedition has been somewhat relaxed, and it is not improbable that some men of experience in whaling will be engaged as "ice quartermasters."

WE believe a few French naval officers desire to join the forthcoming English Polar Expedition, as Lieut. Bellot did on the occasion of one of the most interesting searches for Franklin. As is known, Bellot lost his life during the expedition, and the fact is commemorated by a column erected at Greenwich Hospital at the expense of the English Government.

LIEUT. CAMERON, in a despatch to Lord Derby, dated Ujiji, May 14, tells of an important discovery to which we briefly alluded last week in our report of the meeting of the Geographical Society. He has been all round the southern portion of Tanganyika, and believes he has discovered its outlet in a river named the Lukuga, a little to the south of Speke's Islands. He thinks also, from what he has heard from the Arabs, that the Lualaba is the Congo. The Lukuga he found to be obstructed with grass, but he believes a way might easily be cut through that. If Lieut. Cameron's conjectures turn out to be correct, and there appears to be great likelihood that they will, he will deserve to take an important place in the ranks of African explorers. He shows the great capabilities of Central Africa as a field for legitimate commerce, and if it turns out that navigation is possible from the mouth of the Congo to the Tanganyika region, much good may be expected to accrue to Africa as well as to the commercial world at large. The curse of the country is still those degraded Arab slave-dealers who vexed the soul of poor Livingstone, and it is a monstrous pity that some steps could not be taken to stamp out the demoralising and devastating traffic. Full details of Lieut. Cameron's explorations are in the hands of the Geographical Society.

THE last two parts of Petermann's *Mittheilungen* are naturally full of the Payer-Weyprecht expedition. The December number contains two letters from Lieut. Weyprecht, and one from Lieut. Payer, to Dr. Petermann. The former intimates that the amount of material collected in connection with the geography, meteorology, magnetism, &c., is immense; during the course of next year he will be preparing these for publication. He briefly states, as some of the conclusions he draws from the work of the expedition, that it is erroneous to conclude either that an open polar sea exists in the north, or that the ice on the south of Franz-Joseph's Land is impenetrable; that the drift of the ship in the ice was in no way owing to the Gulf Stream; and that he still adheres to the opinion that much valuable exploratory work can be done towards the east, with the Siberian coast as a basis of operations. Lieut. Payer believes that the nearest road to the pole is that by which the English Arctic Expedition is to go—Smith's Sound.

THE *Daily Telegraph* of Monday contains a long letter giving a very interesting account of Zanzibar, from Mr. H. M. Stanley, the leader of the expedition sent out by that paper in conjunction with the *New York Herald*. Another is to follow giving a description of the preparations for Stanley's long African march of discovery, and the detailed plans of route. This expedition is exceedingly creditable to the two papers, and it is a hopeful sign that a daily journal finds it answer to fill its columns with such healthy excitement.

A COMMUNICATION from her Majesty's ship *Scout* states that a monument has been erected on one of the islands of the Pacific to the memory of Captain Cook, who was killed by the natives of Owhyhee, ninety-five years ago. The monument is an obelisk 25 ft. high, and mounted on a base 8 ft. square. It is of concrete, and bears the following inscription:—"In memory of the great circumnavigator, Captain James Cook, R.N., who discovered these islands on the 18th of January, A.D. 1778, and fell near this spot on the 14th of February, A.D. 1779. This monument was erected in November, A.D. 1874, by some of his fellow-countrymen." It is erected on a suitable spot, about 100 yards from the rock on which the captain fell.

M. LEVERRIER, having finished with his tables of the Planet Neptune, will resume the duties of an active observer. For 1875 he will superintend personally the service of meridian observations at the Observatory of Paris, at the same time fulfilling all the duties of director of the establishment. M. Loewy will have the care of the special determinations of longitudes. These arrangements have been proposed by the Council of the Observatory to the Ministry, and will be no doubt approved of.

THE process of polishing the lens of the mirror of the great telescope is going on at the French National Observatory by M. Martin. The diameter of the lens is 120 centimetres, and the polisher is a disc of 40 centimetres. The number of men engaged on the polishing is six. They are obliged to stop frequently on account of the great weight of the polisher. An observer placed on the top of the Observatory, at a distance equal to half the focal distance, superintends the polishing process, watching if the image of a light which is placed in a proper position is reflected with sufficient exactness by the mirror below.

THE weather being very cold in Paris, and heavy falls of snow having taken place, M. Gaston Tissandier has taken advantage of the opportunity to make a series of most interesting observations on the dust which snow appropriates during its passage through the atmosphere. The results will be sent very shortly to the French Institute.

ON Thursday, December 17, at ten P.M., a magnificent falling star was observed in Paris. Its track was to be seen for more than a minute. A correspondent, Mr. J. H. A. Jenner, writing from Lewes, states that "on Thursday evening, the 17th inst., at 10.30, a very fine meteor was seen here. It travelled from north to south at a seemingly very low elevation, and though the moon was shining brightly, it was a very brilliant object, being several times the brightness of Sirius. Its colour was yellowish, and it left a long but not very persistent bluish-white train. Had the night been dark, it must have been a very splendid object. The point of disappearance was hidden from my sight by houses, but there was no noise attending it."

TWO students of Girton College have been examined in the Cambridge Natural Science Tripos. Miss Kingsland, daughter of the Rev. N. Kingsland, Congregationalist minister, Bradford, passed equal to second class, and has been appointed assistant lecturer in Natural Science and Mathematics at Girton College. The other, Miss Dove, daughter of the Rev. J. Dove, vicar of Cowbit, Lincolnshire, would have been entitled to the ordinary degree, and has been appointed to an assistant mistress-ship at Cheltenham Ladies' College, with a special view to teaching physiology. These ladies passed the *vivâ voce* examination, and also in physiology and chemistry.

DR. J. G. M'KENDRICK recently commenced in Edinburgh a series of lectures to ladies on Physiology, at which we are pleased to hear there is an attendance already of seventy-one ladies.

THE Laurium mines in Greece have given rise to a new difficulty, not of a diplomatic, but of a botanical nature. Seeds which had been buried amidst the remains of old explorations for 2,000 years, on being exposed to the air have undergone the usual process of germination, &c. These belong to the genus *glaucium*, but the species seems quite lost.

THE *Telegraphic Journal* for December 15 contains a figure and description of a most ingenious self-regulating electric lamp, by Siemens and Halske. This lamp is of very simple construction, and is stated to regulate itself with great accuracy. It is capable of being used either with a current of single direction or with the alternating current produced by certain magneto-electric machines.

WE have before us a Belgian Governmental publication in the *Bulletin de la Fédération des Sociétés d'Horticulture de Belgique*, for 1873. The volume contains biographies and portraits of eminent Belgian horticulturists recently deceased. A number of papers are printed in it, chiefly connected with Belgian horticulture; and it is supplemented by a list of all persons holding official botanical posts throughout the world.

LIEUT. CONDER, R.E., the officer in charge of the Palestine Survey Expedition, reports important discoveries of ruins in the hill country of Judah, which he proposes to identify with some of the lost Biblical cities and sites. He has been also engaged in a search for the limits of the Levitical towns, hoping to find some inscription or monument similar to that which rewarded M. Ganneau at the city of Gezer. He has not found any Hebrew inscriptions, but appears to have discovered boundary stones which may prove to be the ancient Levitical landmarks. Lieut. Conder promises to make a survey of Mr. Henry Maudsley's recent discoveries on Mount Zion for the Committee of the Palestine Exploration Fund.

THE report is to hand of Prof. Powell on the Survey of the Colorado of the West, dated Smithsonian Institution, Washington, D.C., April 30, 1874. This survey was placed under the direction of the Smithsonian Institution by Congress. The region embraced in the survey is one of the most interesting, in a geological point of view, in the world. The Colorado of the West and its tributaries traverse a series of remarkable chasms, in some instances of more than a mile in depth below the general surface of the region, presenting in several places, at one view, sections of the greater number of the known geological formations of America. In the report a general summary is given of the entire work. It exhibits a great amount of labour, and a series of results, not only of importance to science, but also to a knowledge of the country in its relations to agriculture and mineralogy. The report embraces a statement of what has been accomplished in the way of, first, Topography, as based on triangulation, including a description of the arable valleys, the supply of water, the extent of timber and of pasture land; second, Geology, including economic mineralogical products, such as coal, salt, and other minerals; third, Ethnology, comprising tribes, political organisation, languages, manners, customs, mythology, poetry, arts, &c.; fourth, Natural History, including mammals, birds, reptiles, insects, and plants.

SOME time since we intimated in NATURE that the enterprising Tyneside Naturalists' Field Club had resolved to catalogue all the remarkable trees in the extensive district which it works. The paragraph referred to has, we are glad to see, been the means of originating a similar enterprise in America. The New England Society of Orange, New Jersey, has issued the first of a series of publications, under the name of the "Babbit Portfolio," giving a history and description of the notable trees in its locality, accompanied by beautifully executed photo-engravings. The first number contains the "Valley Oak" (*Quercus albus*), the "Hillyer Elm" (*Ulmus americana*), and the "Harrison Buttonwood (*Platanus occidentalis*). Dr. Babbit, after whom the Portfolio is named, was the first to set out shade-trees in Orange.

PROF. BUCKLEY, State Geologist of Texas, has published a synopsis of the work done under his auspices during the past season, and remarks that fifty-four counties have been visited by himself and assistants. The results of his investigations show that Texas has vast deposits of iron and coal, of much greater extent than had been anticipated. Both are of excellent quality, and in some cases they occur near together. He has also found an abundance of salt, gypsum, and a wide range of copper ores. Other valuable minerals are roofing slate, marble, soapstone, &c.

THE Engineer Department of the United States Army has issued a "Catalogue of Plants collected in the years 1871, 1872, and 1873, with Descriptions of New Species." This is a portion of a series of publications brought out under the same auspices, being a report of geographical and geological explorations and surveys west of the 100th meridian, under the charge of First-lieutenant G. M. Wheeler.

WE are pleased to learn from the "Tenth Report of the Board for the Protection of the Aborigines in the Colony of Victoria," that the condition of the aborigines from the foundation of the colony was never so prosperous as at the present time. Very successful experiments at hop-growing have been made in some of the districts allotted to the natives, who take kindly to the light and comparatively well-paid work. The cultivation of hops will be extended to other districts. Considerable success has also been attained in the education of the children.

DR. JOHN DOWSON has sent us two pamphlets of which he is the author: "Thoughts, Philosophical and Medical, selected from the Works of Francis Bacon," and "A Sketch of the Life and Works of Erasmus Darwin, M.D., F.R.S." H. K. Lewis, Gower Street, is the publisher.

THE *Quarterly Journal* of the Meteorological Society, just issued, contains a number of papers read during the last session of the Society, abstracts of most of which have appeared in these pages.

THE "Proceedings of the Belfast Natural History and Philosophical Society" for 1872-3-4 have been published. Among the papers of scientific interest are the President's (Mr. J. J. Murphy's) addresses, "On Cosmological Science," and "On the present state of the Darwinian Controversy;" Prof. Everett "On Mirage," published in NATURE, vol. xi. p. 49; "On some New Methods of Chemical Analysis," by Prof. Hodges; "On the Solar Spots," by Mr. Murphy; "On Rainbow, Halos, and Coronæ," by Prof. Purser; "On Underground Temperature," by Prof. Everett; "On the Origin and Metamorphoses of Insects," by Mr. Murphy; "On the Composition of an Inflammable Gas issuing from below the Silt-bed in Belfast," by Dr. Andrews, F.R.S.

WE have received two reprints from the "Proceedings" of the Liverpool Geological Society, 1873-74: "The Metamorphic Rocks of the Malvern Range and the Strata derived from them," by Dr. C. Ricketts, F.G.S.; and "Tidal Action as a Geological Cause," by Mr. T. Mellard Reade, C.E., F.G.S.

IT is gratifying to see, from the Seventh Annual Report of the Eastbourne Natural History Society, that the Society is, on the whole, in a flourishing condition. It is doing very satisfactory work in the collection and arrangement of the fauna and flora of its district.

THE additions to the Zoological Society's Gardens during the past week include a Peregrine Falcon (*Falco peregrinus*), European, presented by Mr. A. F. Ross; a Campbell's Monkey (*Cercopithecus campbelli*) from West Africa, purchased; and eight Canadian Beavers (*Castor canadensis*) from North America, deposited.

THE ROYAL SOCIETY MEDALS

WE have already announced the names of those to whom the Royal Society Medals have been awarded; the following is the official account of the presentation by the Vice-President and Treasurer, Mr. Spottiswoode, at the Anniversary Meeting on the 30th ult.:—

The Copley Medal has been awarded to Prof. Louis Pasteur, one of our foreign members, "for his researches on Fermentation and on Pebrine."

Prof. Pasteur's researches on fermentation consist essentially of two parts: the first part, in which he enters exhaustively into the examination of the products formed in this process; and the second, in which he takes up the question of the cause of fermentation.

Previous observers had noticed the production, in solutions of sugar which had been fermented, of substances other than the two commonly recognised, alcohol and carbonic acid; but it remained for Pasteur to show which were essential and which were occasional products. In the series of able papers contributed to the *Comptes Rendus* and to the *Annales de Chimie et de Physique*, he proved conclusively that succinic acid and glycerine were always found in fermented solutions of sugar, while lactic acid and acetic acid, although occasionally present, were not always so. He also showed that, in addition to these substances, a part of the sugar was converted into cellulose and fat.

The study of the products formed during fermentation opened the way to the second part of the research, viz., the cause of fermentation.

It had been found that certain solutions, when exposed to the air, soon became full of living organisms; and Pasteur's experiments led him to support the view that these organisms originated from the presence of germs floating in the air. He found that no living organisms were developed if care were taken to destroy completely all those which might be present in the solution, and if the solutions were then carefully sealed up free from air. Nor was it necessary to exclude the air, provided that pure air, free from germs, were admitted. By passing the air through red-hot tubes or through gun-cotton before reaching the solutions, he found that the development of organisms, in such boiled solutions, did not take place. An exception to this was noticed in the case of milk, which required to be heated to a higher temperature than the boiling-point of water at atmospheric pressure. Pasteur showed that this was connected with the alkaline reaction of milk, for in all cases in which the development of life was prevented by heating to the boiling-point of water, the solutions had a faintly acid reaction—but that when this was neutralised by carbonate of lime, the solutions then behaved like milk.

Prof. Pasteur also examined the gun-cotton through which the air had been passed; and he found, among other things, certain cells to which he attributed the power of causing the growth of organisms in solutions. By sowing some of these cells in solutions which previously had remained clear, and finding that such solutions speedily became turbid from the growth of living organisms, it was proved that the air which had passed through the gun-cotton had lost its property of causing the development of life in solutions, because the germs which the air contained had been stopped by the gun-cotton.

The result of the second part of the research may be thus summed up:—

1. No organisms are developed in solutions if care be taken to prevent the possibility of the presence of germs.

2. This negative result does not depend upon the exclusion of oxygen.

3. The matter separated from ordinary air is competent to develop organisms in solutions which previously had remained unchanged.

Not less important were the results of Pasteur's experiments respecting the chemical functions of the ferment.

It had been held that the entire ferment was in a state of putrefactive decomposition, and induced a similar decomposition in the sugar with which it was in contact.

In corroboration of this view, it was stated that ammonia (a product of the decomposition of albuminous substances such as those present in the ferment) is always found in liquids which are undergoing fermentation.

Pasteur proved that the ammonia in fermenting liquids diminishes in quantity in proportion as the process advances, and that the yeast-cells increase and grow while forming complex albuminous substances at the expense of the ammonia and other